SPECIMENS OF PLANTS COLLECTED AT KING GEORGE'S SOUND BY THE REV. R. COLLIE, F.L.S.

By The Rev. Dr. Woolls, F.L.S.

The specimens collected by the Rev. R. Collie, though containing nothing new, are nevertheless highly interesting. The Rev. gentleman seems to have visited part of the same ground which the eminent Robert Brown examined in the early portion of the present century, when he was attached as naturalist to Flinders's expedition, and when further he collected some of the same species which attracted Mr. Collie's attention. King George's Sound, therefore, has a history in the progress of botanical science, having as it were acquired classic celebrity from the labours of Brown, and from the appropriate names which he gave to many of its plants. From the small collection of Mr. Collie, only a limited idea can be formed of the peculiarity exhibited by our South-western Flora; but, so far as the collection goes, especially in the orders Leguminosæ, Myrtaceæ, Proteaceæ, and Epacrideæ, it tends to illustrate the fact, so strikingly enunciated by Sir J. D. Hooker in his "Introductory Essay on the Flora of Tasmania," that the proportion of species in S. W. Australia is much greater than in the S.E., and that the striking differences in the genera and species of the two quarters open for consideration questions of deep significance in regard to the creation and distribution of species. Though Hooker's work was published in 1859,—that is about twenty years before the completion of the *Flora Australiensis* by the united labours of Bentham and Mueller, his views are still found to be correct, whilst the probability that Western Australia was the centrum of Australian vegetation is still further confirmed by the opinions of our eminent Geologist Mr. Wilkinson, and the recent calculations of Baron Mueller in his Census of Australian

Plants. With regard to the distribution of the latter, it appears that, of the known species in Australia now reckoned about 9000, they occur respectively in

Western Australia.....3559
South Australia.....1904
Victoria.....1904
New South Wales.....3260

This calculation fully bears out the importance of the Western Flora, whilst the fact remains, in reference to the Floras of the S.W. and S.E. regions, that the genera of the former are much larger than those of the latter, and the species proportionally more numerous.

Following is a list of the plants furnished by Mr. Collie :—

EPACRIDEÆ

1. *Leucopogon alterniflorus*, R.Br.
2. *Andersonia sprengelioides*, R.Br.
3. *A. micrantha*, Sond.

MYRTACEÆ.

4. *Hypocalymma strictum*, Schau.
5. *Agonis flexuosa*, Schau.
6. *A. theæformis*, Schau.
7. *A. marginata*, Schau. (?)
8. *Melaleuca striata*, Labill.
9. *Eucalyptus marginata*, Sm.

PROTEACEÆ.

10. *Petrophila rigida*, R.Br.
11. *Adenanthos cuneata*, Labill.
12. *Conospermum flexuosum*, R.Br.
13. *Franklandia fucifolia*, R.Br.

14. *Persoonia longifolia*, R.Br.
15. *Grevillea Brownii*, Meissn.
16. *Hakea trifurcata*, R.Br.
17. *Banksia grandis*, Willd.
18. *B. Brownii*, Baxt.
19. *B. coccinea*, R.Br.

LEGUMINOSÆ.

20. *Psoralea pinnata*, W. (Int.)
21. *Phyllota barbata*, Benth.
22. *Jacksonia spinosa*, R.Br.
23. *J. horrida*, DC.
24. *Daviesia divaricata*, Benth.
25. *Bossiæa Preissii*, Meissn. (?)
26. *Acacia pulchella*, R. Br.
27. *A. alata*, R.Br.

COMPOSITÆ.

28. *Pithocarpa corymbulosa*, Lindl.
29. *Olearia cassiniæ*, F.v.M.

POLYGALEÆ.

30. *Comesperma confertum*, Labill.

PITTOSPOREÆ.

31. *Sollya heterophylla*, Lindl.
32. *Billardiera variifolia*, DC.

RUTACEÆ.

33. *Boronia spathulata*, Lindl.

UMBELLIFERÆ.

34. *Xanthosia rotundifolia*, R.Br. (?)
35. *Trachymene eriocarpa*, Benth. (?)

RESTIACEÆ.

36. *Anarthria scabra*, R.Br.
37. *Lepyrodia stricta*, R.Br. (?)
38. *Anarthria prolifera*, R.Br.

Of the three Epacrids not one of them extends to the Eastern Coast. The genus *Andersonia*, containing 20 species, is limited to W. Australia. Some of them approach our *Sprengelia*, but they differ materially in the shape of the corolla and its æstivation. *Leucopogon alternifolius*, which was collected by Brown during his voyage with Flinders, has some resemblance to our *L. amplexicaulis*, but it is smaller in every part. It seems rare, as Mr. Bentham's only specimen was from Brown's collection. Of the 118 species of *Leucopogon*, 23 only occur in N. S. Wales, but of the genus *Epacris*, none have been found in W. Australia.

The plants of Myrtaceæ belong to four genera, two of which are not represented in N. S. Wales, viz., *Hypocalymma* and *Agonis*, the former with 12 and the latter with 11 species, all in W. Australia. The Rev. B. Scortechini found a species of *Agonis* on Stradbroke Island (Queensland), and that is described by Baron Mueller as being a remarkable species, extending the limits of the genus to the Eastern Coast. *Melaleuca striata* is strictly a western species, though resembling some of the eastern ones. Nearly 100 species of the genus are described, but only 17 extend to N. S Wales, and of these *M. acuminata*, *M. parviflora*, *M. uncinata*, and *M. leucadendron* are common to W. Australia. It should be considered in studying the distribution of species, that *M. leucadendron* is widely spread in the Oriental Archipelago and Malayan Peninsula. *Eucalyptus marginata* is the Jarrah of W. Australia, and is reckoned among the forest resources of the west (Baron Mueller's Report). Baron Mueller calculates that of the 150 Eucalypts now pretty well known, 80 are found in W. Australia. It is strange that only *E. rostrata* and a few of the smaller kinds, designated "Mallee," are common to N. S. Wales and W. Australia.

The Leguminosæ (with the exception of *Psoralea pinnata*, a plant introduced from the Cape of Good Hope, and found also near Sydney) have species of each genus in N. S. Wales, but not identical with any in the west. *Phyllota barbata* does not appear so variable as our *P. phylicoides*, and it is well distinguished by its fringed style. *Jacksonia horrida* and *J. spinosa* differ very much from our *J. scoparia* (which is leafless and grows to be a small tree), and they are rigid shrubs with angular and striate branches. In the *Flora* 28 species are described, all, with one exception, western. But since the publication of that work, the Baron has recorded seven new ones in his *Fragmenta*, three of which occur in the eastern part of Australia. *Daviesia divaricata* is a leafless plant with sulcate spinescent branches. Of 55 species of *Daviesia*, only 13 occur in N. S. Wales. The specimen of *Bossiæa* being only in leaf is doubtful, but in that genus the species are more numerous in the west than in the east, nor are any of them identical. Of the large genus *Acacia*, numbering about 300 species, *A. alata* and *A. pulchella* are remarkable, the one for its bifariously decurrent phyllodia, and the other for its minute pinnate leaflets. Both of these plants were collected by Brown and named by him. Of the Acaciæ 122 occur in W. Australia, and less than 100 in N.S.W. Very few species are common to all the Australian Colonies.

The Proteaceæ belong to eight genera, six of which extend to the east, but the species are different. *Petrophila rigida* is similar to some of ours, but more rigid in foliage. *Conospermum flexuosum* is an under-shrub with divaricate angled branches, and unlike our species in aspect. *Persoonia longifolia* and *Grevillea Brownii* are similar in character to some of the eastern species, but *Hakea trifurcata* has two kinds of leaves varying very much in shape. Of the three Banksias, *B. grandis* is distinguished by its large pinnatifid leaves, *B. coccinea* is remarkable as being one of the species figured by F. Bauer, and *B. Brownii*, Baxt., for its long, narrow whorled leaves. *Adenanthos cuneata* and *Franklandia fucifolia* belong to genera exclusively western, the one having cuneate silky leaves, and the other terete ones repeatedly forked.

W. Australia is rich in Proteaceæ, and the large genus *Dryandra* occurs nowhere else.

Of the two Composites, *Pithocarpa corymbulosa* is the only species of the genus, and, though approaching *Humea*, differs from it in habit and involucre. It is a small plant with long slender stems forming nearly leafless panicles of little white flowers. *Olearia cassiniæ* seems peculiar to King George's Sound and Lake Leven, and belongs to a series of plants differing very little from each other. Indeed, when comparing it with some of our Eastern species, especially *O. ramulosa*, it is very difficult to say whether they are all distinct species or not.

Having glanced at the most striking of Mr. Collie's specimens, it may not be out of place to make some general observations on our flora as bearing on the differences between the eastern and western species and genera. Mr. Bentham's opinion was that the predominant portion of the Australian flora was indigenous, although there appeared to be a very remote ordinal, tribual, or generic connection with African forms. He also recognised on the one hand, an ancient connection between Australia and India, and on the other, a still more ancient one, through the Alpine Flora of Victoria, Tasmania and New Zealand, even to the American Continent. Whilst fully acknowledging the sagacity of the distinguished Botanist as accounting for the diversity of forms found in Australia, the difficulty still remains of accounting for the great differences in the genera and species of S.W. and S.E. Australia. Sir J. D. Hooker, after having expressed an opinion that Western Australia might be regarded as the centrum of Australian vegetation, whence a migration proceeded Eastward and led gradually to the differentiation of specific forms, suggests that the inquiry cannot be pursued satisfactorily without a knowledge of the comparative geologic ages of the respective regions. On this question I am permitted to quote a passage from a communication addressed to me by our indefatigable Geologist Mr. Wilkinson :—"I do not think that the Western Australian Flora can be rightly understood until studied in connection with the

distribution of the Tertiary Flora, from which the recent one has been developed, also with the changes in the physical geography of the continent which have directed that distribution. Imagine the luxuriant condition of the vegetation, especially upon South-eastern Australia, during the great rainfall period which immediately preceded the recent flora, when the great Riverina Plains were formed by higher floods than those occurring at the present day; and when crocodiles sported in swampy jungles along the Darling River in places 15 miles distant from the river, and now dry plains! In that period Lake Torrens and Lake Eyre were probably connected with Spencer's Gulf and stretched northward far into the continent. Then, in the previous Miocene times, Australia stood at a lower level, and *the ocean occupied all that low country between Spencer's Gulf and Western Australia.* Then again in the Cretacean period, about *two-thirds of Australia must have been under the ocean.* Under these conditions how did the plants migrate? And with alteration of the form of sea and land, the ocean currents, with warm or cold water, as the case might have been, varied accordingly and affected the temperature of the climate of the different localities; for along the coast *near Adelaide* the rocks are grooved with *glacier* striæ. These changes of temperature, therefore, and of rainfall, must at times have greatly favoured the growth of certain plants, and the diminution or extinction of others until the present distribution resulted." It would be presumptuous in me to pursue this subject any further, but I can easily imagine that, at a period when Eastern and Western Australia were separated by an intervening sea, the migration of many plants from the west (a migration which had probably commenced) was rendered impossible; and this may account for the fact that so many forms of vegetation have remained isolated from the rest of Australia, and that the flora of the S.W. is richer than that of the S.E. Anyone by studying the census of plants, as furnished by Baron Mueller, must see how, in some genera truly Australian, the species are all limited to the west, and how, in other genera, a few species only have found their way east. How can such things have happened unless some great physical changes have

interrupted the ordinary sequence of events? If, as enunciated by Baron Ettingshausen, the whole existing vegetation of the world can in its development be traced to a universal flora of bygone geologic ages, and if, as stated by Mr. Wilkinson, the process of development through countless periods has been accompanied by catastrophes such as can scarcely be imagined in these days, a theory may doubtless be constructed as satisfactory to the Botanist as to the Geologist. However that may be, the hand of infinite wisdom may be traced in all the works of the Creator, as tending to the gradual development of His purposes, the preservation of species adapted to different soils and climates, and a providential care for the wants of humanity.